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ABSTRACT

Relationships between measures of sociometric status (SMS) and the behavior of preschool children were investigated. SMS was assessed through use of a comprehensive ranking technique that obtained data on each child from every other child in the sample. Measures of SMS included number of first nominations received (as "best friend"), number of last nominations received, and mean ranking. For each child, an SMS measure was calculated with data from the entire sample and from the child's immediate peer group. Children's type of play, verbal interactions, and involvement in behavioral events were observed and recorded. Participating were 13 boys and 13 girls between the ages of 38 and 64 months attending a university laboratory school. Results of correlational analyses indicated that SMS was associated with percentage of free time spent in interactive play, frequency of speaking to adults and other children, and quantity of interactions with other children. A high rate of one-to-one interactions between children and adults was inversely related to SMS. Rankings based on the entire sample were more sensitive than those based on the immediate peer group. Number of first nominations was the best predictor of type of play behavior; last nominations and mean ranking were better predictors of quantity of verbal interactions with peers and adults. The frequencies of a variety of positive and negative interactions were positively correlated with SMS. (Author/RH)

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Behavioral Correlates of Sociometric

Status in Preschool Children

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Abstract

Relationships between measures of sociometric status (SMS) and behavioral observations were obtained for 26 children. SMS was assessed using a comprehensive ranking technique. Observational measures of children's type of play, verbal interactions, and of various behavioral events were recorded. Measures of SMS included number of first nominations received, number of last nominations received, and mean ranking. An SMS measure was obtained for the entire sample and for each child's immediate peer group. SMS was associated with higher levels of interactive play, with frequency of speaking to both adults and to other children, and with quantity of interactions with other children. Most correlations remained significant with the effects of age controlled. A high rate of one-to-one interactions with adults was inversely related to SMS.

Rankings based on the entire sample were more sensitive than those based solely on the immediate peer group. The number of first nominations was the best predictor of type of play behavior while last nominations and mean ranking were better predictors of quantity of verbal interactions with peers and adults.

Among the specific categories of peer interactions recorded, frequency of a variety of positive and negative interactions were positively correlated with SMS. Results of the present investigation add support to the position that quantity of interaction is more significant than the quality or nature of those interactions in the determination of preschool children's SMS.

Behavioral Correlates of
Sociometric Status in Preschool Children

The study of social competence has occupied the attention of researchers over the past 25 years. Numerous studies of elementary school children have reported correlations between measures of social competence assessed during childhood, and a variety of indices of related competences in later life, including mental health status as an adult (Cowen, Pederson, Babigan, Izzo, & Trost, 1973) juvenile delinquency (Roff, Sells, & Golden, 1972), and academic achievement (Kohn, 1977).

On the preschool level, concurrent validity studies are numerous, however they often report contradictory findings. Marshall and McCandless (1957) found that social competence assessed using a picture board nomination procedure was correlated to teacher ratings of social competence. Furthermore, children interacted more often with the child they had identified as their "best friend." In an earlier review of the literature, Hartup (1970) concluded that sociometric status was related to sociability and friendliness, and inversely related to aggressiveness. Charlesworth and Hartup (1967) found sociometric status to be related to the frequency of both the giving and the receipt of positive reinforcement. Moreover, category of play behavior (Goldman, Corsini, & deUrioste 1980) and social skill mastery (Rubin, 1972; Rubin & Maioni, 1975) have been associated with sociometric status. On the other hand, several studies (e.g. Deutsch, 1974; Jennings, 1975; Gottman, 1977) have failed to find any significant relationship between sociometric status and rate of interaction among preschool children.

It has been suggested that the inconsistent, often contradictory, findings reported in the literature may be a product of the considerable range of methodologies employed. Peer nominations, peer ratings, teacher ratings and comparisons of all possible pairs have all been used fairly extensively in the assessment of sociometric status (SMS). With the variety of techniques utilized, it is not surprising that results are often conflicting.

Each method of assessment appears to have certain limitations. Studies using nomination scores are further complicated by the fact that individual studies may be based on positive or negative nominations only, both positive and negative nominations with each considered separately, or a single score combining information obtained through positive and negative nominations. Since positive and negative nominations are correlated with different clusters of behavior (Hartup, Glazer, & Charlesworth, 1967; Gottlieb, Semmel, & Veldman, 1978; Vaughn & Waters, 1981) it would seem that neither positive nominations alone nor a combined positive/negative nomination score is capable of fully tapping the range of behaviors which may be associated with SMS (Foster & Ritchey, 1979). Moreover, the inclusion of negative nominations (singularly or in combination) has become of problematic value. In a number of recent investigations (Foster & Ritchey, 1979; Moore, 1967; Greenwood, Walker, Todd & Hops, 1979) the use of negative nominations has been ruled out either because of ethical reservations of the experimenters or due to objections raised by Human Subject Review Boards. Although rating scales have the advantage of being more reliable than nomination measures used with preschool populations (Asher, Singleton, Tinsley, & Hymel, 1979), the ethical constraints on the use of peer ratings of socially undersirable behaviors may be equivalent to those for negative nominations (Foster & Ritchey, 1979). In both cases the usual adult role of discouraging rejecting and negative appraisals of peers is reversed (Moore, 1967).

Comparison of all possible pairs of peers may be a more reliable sociometric procedure but it is also extremely time consuming (Hartup, 1970). In addition, this procedure may be too demanding of preschool children. The use of multiple sessions may be required, in which case reliability of the measure may be reduced. Given the psychometric and practical difficulties associated with preschool sociometrics a number of investigators (e.g., Greenwood et al., 1979; Connolly & Doyle, 1981) have argued for the use of teacher ratings rather than that of peer assessments. Results suggest teacher rankings are more reliable than positive peer

nominations and that teachers are more capable than peers in the identification of socially withdrawn children. However, results obtained from teacher ranking and peer nominations in the studies cited above may not be directly comparable. Peer evaluations are based on a single, positive criterion whereas teacher evaluations are based on multiple criteria including both positive and negative behaviors. Also, the apparently greater reliability of teacher rankings may be reflective of the fact that teacher rankings necessitate an assessment of each child whereas the peer nomination procedure produces data on only three children per rater. Furthermore, the evidence indicates that adult measures of SMS are influenced by a variety of child characteristics including IQ, SES, activity level, and manageability (Vaughn & Waters, 1981).

In the present investigation an attempt was made to employ a method of assessing SMS which, 1) permitted obtaining data on each child from every other child; 2) avoided demands for negative peer appraisals; and 3) was not overly expensive or time consuming.

A comprehensive ranking procedure (described in detail below) was utilized. It was hypothesized that, unlike positive and negative nominations, the more complete ranking system would be related to both positive and negative classroom behaviors. A secondary purpose of the study was to consider the efficacy of the comprehensive ranking procedure as compared with the number of first nominations a child receives. The former is an operational measure of the child's overall popularity while the latter indicates whether or not one is considered a "best friend" by another child. Foster & Ritchey (1979) have pointed out that the two measures are not necessarily correlated and that research has yet to ascertain the relative importance of the respective measures in the determination of later social competences.

Method

Subjects

The participants were 26 children between the ages of 38 and 64 months ($\bar{x} = 50.5$)

attending a University laboratory preschool. An equal number of males and females participated. All of the children were enrolled in the four hour per day nursery school program and 11 children attended an additional two to four hours per day.

Procedure

Sociometrics A measure of SMS was obtained for each child through a pictorial ranking procedure. A 2 x 3 black and white photograph of each child was utilized. Photos were presented in an array according to a predetermined random order. This procedure was similar to that developed by McCandles and Marshall (1957) and elaborated upon by Connolly and Doyle (1981). Unlike previous studies however, a complete rank ordering was obtained in the present study rather than a pre-selected number of nominations. Subjects were asked to name each photo. If a child failed to correctly identify any photo, the experimenter stated the name of the child and asked the subject to repeat the child's name (Moore & Upderaff, 1964).

Subjects were then instructed,

to pretend there is a new toy at school and only a few children can play with it at a time. Pretend it is your turn to play with the new toy and you can pick two other children to play with you. Look through the pictures of all the children and tell me which two children you would like to play with.

The examiner then removed the chosen pictures from the array, saying, "Now pretend these two children did not come to school today. Look through the pictures again and pick two other children you would like to play with."

This procedure was repeated until all photos had been identified and rank ordered. The same procedure was administered a second time using only the photos of children in the subject's immediate peer group (IPG), i.e. the group with whom the child ate snack and engaged in various small group activities. The three such groups contained seven, nine, and ten children respectively.

Five different indices of SMS were derived from the data collected, three based on rankings within the entire sample and two based on IPG rankings. These measures included the number of first nomination and mean sociometric rank for both IPG and for the total sample, and the number of last nominations obtained on the total sample.

Observational Measures Observational data were recorded over a period of three weeks by undergraduate students enrolled in a child development course. All observers received a minimum of four hours training, including didactic lectures, role playing episodes, practice sessions, and a paired observation trial. Observational data were collected only during free play sessions between the hours of 9:30 and 11:00 a.m. During these hours children were free to engage in a variety of activities, to play alone or in groups, and to play with any of the other children attending the school, independent of age or group assignment.

Three separate sets of observations were assembled. One set recorded type of play, a second recorded verbal interactions, and a third focused on specific behavioral interactions. For all three data sets, each observer was randomly assigned four children per each hour of observation.

1. Play A time sampling measure of type of play similar to that developed by Parten (1932) and modified by others (McGrew, 1972; Goldman, 1977; Goldman et al., 1980) was employed. Observers were provided stop watches and instructed to observe each child assigned for five seconds, on a continuing rotation basis with 25 second recording intervals interspersed between observations. After each 5 second interval, observers categorized the subjects play behavior as either Unoccupied, Onlooking, Solitary, Parallel, Interactive, Adult one-to-one, or Teacher Directed. The mean number of observations per child was 74.08 (range 55 to 110).

2. Verbal Verbal behavior was assessed using a time sampling measure with behavioral categories adapted from White and Watts (1973). As during the play

measures, five second observations and 25 second recording intervals were used. Child-to-child categories included Elicitive, Negative, and Other verbalizations. Both the verbalizations of the target child and those directed toward him/her were recorded. Two categories of child-adult verbalizations, Attention-Seeking and Other were recorded. Adult-child categories were Rule Stating, Guiding, Questions, and Other. In addition, Self-Talk was recorded. If no verbalizations occurred during the 5 second interval, the category "None" was used.

Following four successive observation and recording periods, the observer began attending to another target child. After observing four subjects four times each, the observer began again with the first target child assigned. Under observations of verbal behavior, the mean number of observations per child was 107.81 (range 58 to 156).

3. Behavioral Events Eleven categories of behavior were recorded: Noncompliance, Yell, Physical Affection, Verbal Affection, Permission, Enlist, Assist, Disagree, Interfere, Attack, and Insult. Observers attended to each child for periods of ten minutes, during which time all occurrences of the above behaviors were recorded. Behaviors were further categorized in terms of child-adult interactions, and initiator/recipient behaviors. The categories and scoring system were adapted from White and Watts (1973) with modifications suggested by others (Connolly and Doyle, 1981; Goldman, 1981). Subjects were observed for an average of 54.6 minutes (range 40 to 70 minutes).

Median percent agreement scores for paired observations were 88%, 94% and 87% for play, verbal, and behavioral interactions, respectively.

Results

Sociometric Status and Type of Play

All three measures of SMS (number of first nominations, mean rank, and number of last nominations) based on the entire sample were correlated with percentage of free time spent in interactive play. Obtained product-moment correlations

were $r = .53$, $p < .01$; $r = -.36$, $p < .05$; and $r = .39$, $p < .05$, for number of first nominations, number of last nominations, and mean sociometric rank, respectively. The latter two measures were also significantly related to time spent in one-to-one interaction with adults ($r = .43$, for last nominations, $r = -.42$ for mean rank, $p < .05$) for both correlations. The number of first nominations was also inversely related to both percentage of time spent unoccupied ($r = -.48$, $p < .01$) and percentage of time onlooking ($r = -.35$, $p < .05$). Neither of the IPG measures of sociometric status were significantly correlated with any of the play measures. With the effects of age partialled out, correlations between interactive play and both last nominations and mean rank were no longer significant. However, with this procedure, correlations of percentage of time spent on a teacher directed activity and both last nominations and mean rank were significant, ($r = -.35$, $p < .05$ and $r = .40$, $p < .05$ respectively). In addition, the correlation between last nominations and onlooking is now significant ($r = -.36$, $p < .05$). For first nominations, the correlation with onlooking behavior no longer reaches significance at the $p < .05$ level. The level of significance for all other correlations was unaffected by the partial correlation procedure.

Sociometric Status and Verbal Behavior

The number of last nominations was significantly related to the quantity of verbal interaction with both other children and adults ($r = -.05$ and $r = -.60$, respectively; $p < .01$ for both cases). The same pattern was observed for correlations with mean rank ($r = .52$, $p < .01$ for verbal interaction with other children; $r = .44$, $p < .05$ for verbal interactions with adults). First nominations were unrelated to quantity of verbal interactions, as were the IPG sociometric measures.

With the effects of age removed, the magnitude of the correlations obtained was reduced. Yet, child-to-child verbal interactions were still correlated with both last nominations and mean rank ($r = -.41$, $p < .05$ and $r = .39$, $p < .05$, respectively). The quantity of child-adult verbal interactions is also significantly

related to last nominations ($r = -.54, p < .01$). However, the correlation with mean rank was nonsignificant ($r = .34, p = .05$). Complete silence during the interval sampled was significantly, but negatively, related to the number of first nominations ($r = -.41, p < .05$) and mean rank ($r = -.55, p < .01$), and positively correlated with last nominations ($r = .62, p < .001$). All of these correlations remain significant with age controlled: $r = -.36, p < .05$; $r = -.46, p < .01$; and $r = .56, p < .01$; respectively.

Two specific categories of child initiated verbal exchanges with other children were recorded. Eliciting the involvement of other children was significantly related to last nominations and mean rank ($r = -.55, p < .01$ and $r = .52, p < .01$, respectively; $r = -.48, p < .01$ and $r = .41, p < .05$, with age controlled). Quantity of negative remarks was not significantly related to any of the sociometric measures. When child-to-child verbal interactions other than Elicitive or Negative are considered separately, significant correlations are obtained among first nominations ($r = .55, p < .01$), last nominations ($r = -.35, p < .05$), and mean rank ($r = .46, p < .05$). With the effects of age controlled, however, only the correlation with first nominations remains significant ($r = .51, p < .01$).

Two categories of children's verbal behavior directed toward adults were recorded, attention getting utterance and other verbalizations. Verbally seeking adult attention was correlated with first nominations ($r = .42, p < .05$), last nominations ($r = -.42, p < .05$), and mean rank within IPG ($r = .40, p < .05$). All correlations remained significant with age partialled out ($r = .39, -.39$, and $.46$, respectively; $p < .05$ for all cases). Other child-to-adult verbalizations were correlated with last nominations ($r = -.40, p < .05$) and mean rank ($r = .34, p < .05$). Only the former was significant ($r = -.35, p < .05$) with age controlled.

No significant correlations were obtained between sociometric measures and any of the four categories of adult verbalizations directed toward children. Being the object of another child's verbalization was recorded in one of three categories: Elicitive, Negative, and Other verbalization directed toward the

child. Receiving negative verbalizations was positively correlated with first nominations ($r = .48, p < .01$). Receipt of other verbalizations was inversely correlated with last nominations ($r = -.33, p < .05$). Receipt of elicitive verbalizations was unrelated to the sociometric measures.

Interestingly, age was unrelated to the receipt of verbalizations, and apparently, acted as a mild suppressor variable. Partial correlations with age controlled slightly augmented the significance of correlations obtained between receipt of negative verbalizations and first nominations ($r = -.34, p < .05$). In addition, the correlation between receipt of other verbalizations and mean rank reaches significance ($r = .38, p < .05$).

Sociometric Status and Behavioral Events

The quantity of a child's interactions with adults was not related to SMS. Likewise, the sum of positive interactions with adults was unrelated to SMS. Sociometric status was, however, inversely related to the receipt of positive adult attention ($r = -.33, p < .05$ for number of IPG first nominations; $r = .51, p < .01$ for last nominations; $r = -.39, p < .05$ for mean rank). Correlations with last nominations and mean rank were significant with the effects of age controlled ($r = .52, p < .01$ and $r = -.39, p < .05$, respectively).

Quantity of interactions with other children was significantly related to last nominations ($r = -.47, p < .01$), mean rank ($r = .40, p < .05$), and IPG first nominations ($r = .64, p < .001$). Excepting mean rank, all correlations remained significant with age controlled ($r = -.36, p < .05$; and $r = .64, p < .001$, respectively).

Kendall correlation coefficients were calculated between each event sampling category and each sociometric measure. Only 14 of 110 correlations between sociometric variables and child-adult interactions were significant. Since approximately

six would be expected by chance at the $p < .05$ level of probability, extensive interpretation of the interactions among these variable is not justified. Furthermore, no clear pattern of correlations was evident for either the child-adult or the adult-child interactions.

The sociometric variables were much more consistently related to the initiating and the receipt of child-to-child interactions. Last nominations were inversely related to yelling ($r = -.45$, $p < .01$), physical affection ($r = -.45$, $p < .01$), verbal affection ($r = -.38$, $p < .01$), and enlisting ($r = -.35$, $p < .05$). Mean rank was significantly correlated with the same variables ($r = .48$, $p < .01$; $r = .60$, $p < .01$; $r = .37$, $p < .05$; and $r = .52$, $p < .01$, respectively). Number of first nominations was associated with enlisting ($r = .27$, $p < .05$). IPG first nominations correlated with yelling ($r = .37$, $p < .05$), enlisting ($r = .42$, $p < .01$), interfering ($r = .28$, $p < .05$), and attacking ($r = .30$, $p < .05$). Mean small group ranking was unrelated to all categories.

Under categories where the child was the object of another child's behavior, first nominations were related to verbal affection ($r = .35$, $p < .05$), permission ($r = .35$, $p < .05$), disagreeing ($r = .52$, $p < .01$), and interfering ($r = .31$, $p < .05$). Last nominations were associated with the receipt of little physical affection ($r = -.43$, $p < .01$) and more interference ($r = .27$, $p < .05$). Mean rank was significantly related to physical affection ($r = .66$, $p < .01$) and non-compliance ($r = .37$, $p < .05$). IPG first nominations were associated with verbal aggression ($r = .37$, $p < .05$) and insulting ($r = .30$, $p < .05$). IPG mean rank was significantly correlated with only enlisting ($r = -.28$, $p < .05$).

Discussion

Sociometric status was associated with developmental play level, with frequency of speaking to adults and other children, and with quantity of interactions with other children. The majority of these correlations remained significant with the effects of age partialled out. Interactive play was associated with high

SMS, while, as may be anticipated, unoccupied and onlooking behavior were correlated with low SMS. One interesting variation of this pattern was that low SMS was also related to high amounts of one-to-one interactions with adults. These findings are consistent with the existing literature which suggests that popularity and dependency on adults are inversely related (Marshall & McCandless, 1957; McCandless, Bilous, & Bennett, 1961; Moore & Updegraff, 1964). Several explanations may be advanced to account for this finding. First, either adults were sought out more frequently by these children or, conversely, low status children were more frequently engaged by teachers. Alternatively, frequent adult interactions may have lowered peer SMS, possibly as a consequence of reduced opportunities for interaction with other children. While not directly addressing this issue, the evidence tends to support the hypothesis that adults seek out and attend to low status children. Children who are frequently engaged in one-to-one interactions with adults were also more often found engaged in solitary play ($r = .38, p < .05$) while engaging in less interactive play ($r = -.27, p < .10$). Apparently, when not playing with adults, low status children are more likely to play alone than with other children.

Interestingly, observations recorded during behavior event sampling underscore this theme as well; adults were found to initiate a disproportionate number of interactions with low vs. other sociometric status children. Although child-initiated interactions with adults was related to the independently assessed measure of frequency of one-to-one play with an adult, ($r = .35, p < .05$), the correlation with adult-initiated interactions was of much greater magnitude ($r = .64, p < .001$). It appears likely that the ability of adults to identify low status children, coupled with subsequent differential treatment of these children may produce a variety of consequences. These data suggest that low status children may use adult interactions as a substitute for peer interactions.

Observations of children's verbal behavior indicate that high SMS children both speak to other children more and are more often spoken to than are low SMS children. It would seem that the quantity of verbal interactions is more important

than the content, since frequency of elicitive and negative statements are both associated with higher status. Verbalizations directed toward adults and child-adult initiated interactions are associated with higher SMS. Adult verbalizations toward children, however, appear to be unrelated to SMS.

Children high in SMS exhibited more verbal and physical affection. They also enlisted others more frequently than lower SMS children. Sociometric status was also related to yelling and disagreeing. It is possible that higher status children are more likely to use verbal rather than physical means in conflict resolution. Or perhaps the greater number of negative interactions is merely reflective of the greater number of overall interactions characteristic of higher SMS children. Within the IPG these data tend to support the latter hypothesis; higher SMS children were found to engage in more physical as well as verbal negative interactions.

The pattern of correlations obtained suggests a high reciprocity of social behaviors among high SMS children; both giving and receipt of physical affection were associated with high SMS. Logically enough, child-to-child behavioral measures were much more consistently related to SMS than were child-adult measures.

Measures of sociometric status based on the total sample were apparently more sensitive than the IPG measures employed in this study; the latter were correlated with fewer behavioral measures. One implication of this finding is that sociometric status in preschool children may be highly dependent on class size and the number of other children with whom the child has opportunity to interact. Group size may be a significant consideration for all preschool sociometric procedures, not just for nomination techniques (Kane & Lawler, 1978). More specifically, typical preschool classes with small numbers of children and with limited allowance for interactions between classes yield less reliable sociometric data. The number of first nominations was correlated to either measure of behavioral interactions. Number of first nomination was, however, more predictive of type of play and of behaviors directed at the target child. Mean rank and last nominations were somewhat redundant, with the latter appearing to be the more sensitive of the two.

Consistent with previous findings (Hartup et al., 1967; Gottlieb et al., 1981),

no strong relationship was found between first and last nomination ($r = -.19$, $p < .05$). Unlike first nominations, the number of last nominations appears to be largely redundant with mean ranking. It appears that first nomination are more directly a measure of friendship preferences while mean rank and last nominations are more sensitive indicators of salience. Having a strong friendship with one child in a classroom does not necessarily imply that friendships with other children will be equally strong, whereas the salience of a particular child for his/her classmates is likely to be relatively constant.

Overall, results suggest sociometric status is more closely associated with the quantity of interactions than with the quality or specific nature of those interactions. The findings of this investigation are consistent with previous literature "suggesting the 'mere exposure' to social stimuli increases attraction and social interaction (Doyle, Connolly & de Rivest, 1980, p. 218)." These results were obtained in spite of an experimental procedure intended to minimize the effects of salience by requiring children to look at each photo and identify each child by name. It is therefore somewhat surprising that positive and negative interactions were approximately comparable measures in predicting SMS. While it is probable that the nature of peer interactions supplements quantity in SMS selections, the measures employed in the present study suggest the importance of frequency of interaction as a usable means of ascertaining SMS among preschoolers. Further studies utilizing multivariate designs may uncover relationships between SMS and behavioral measures indicating greater support for quantity and quality interactions. The present investigation offers support for the former claim.

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